# Priorities for Global R&D of Interventions: Overview and Synthesis

B. Bloom, C. Michaud, D. Meltzer, J. La Montagne, L. Simonsen

# Definitions

- Research
  - generation of new knowledge
  - development of new and enabling technologies
  - identification of gaps in present knowledge
  - verification of knowledge in different contexts
  - creation and dissemination of products of knowledge to enable that knowledge to become accessible to many people

- Global health research

*pertains to:*

problems, issues and concerns that transcend national boundaries and may be best addressed by cooperative action

***It is critical now to recognize the global nature of health research***

# Key challenges: bridging the gap between needs and opportunities

**Global health agendas**

- Unfinished agenda of infectious diseases
- The coming epidemic - chronic diseases and aging populations
- The unnecessary epidemic – injuries, casualties of war and humanitarian emergencies
- The crisis in health systems

**Research advances**

- Genome project, molecular epidemiology and preventive medicine
- Population based research
- Next frontier: human behavior and social determinants of disease
- Cross-cutting issues: knowledge transfer from developed to developing countries and vice-versa

# Paradigm shifts ?

- 10/90 vs Converging Priorities

  Change the paradigm of advocacy from dividing the world between developed and developing countries ? Convergence between developed and developing country health issues; unique problems of Sub-saharan Africa

- Global research collaboration

  In many developing countries, *capacity* – people with training to carry out surveillance, laboratory and operational research- is critically limiting – thus there is an enormous need for training

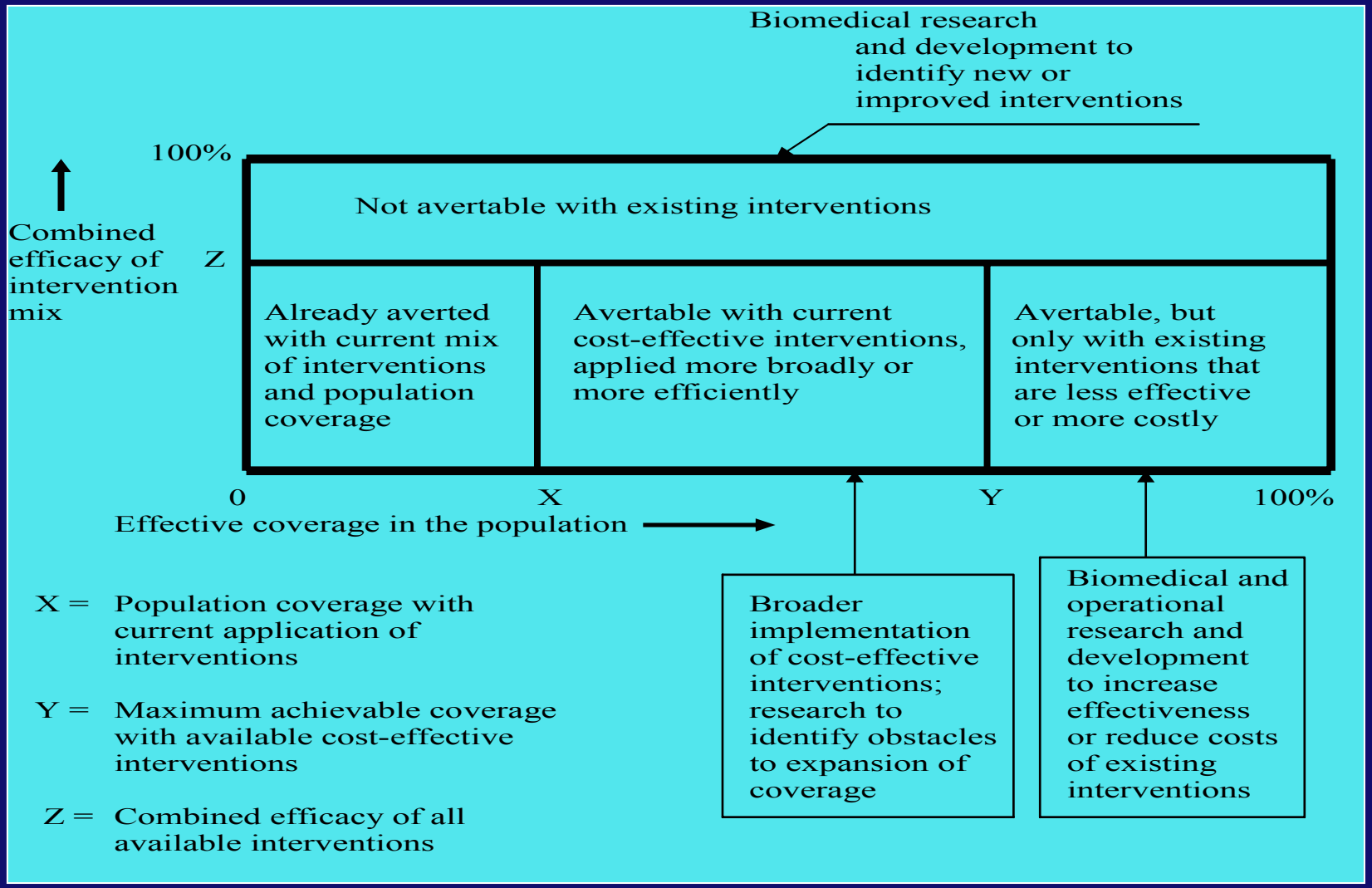
  The global response to SARS highlighted the power of international collaboration, but also raised difficult issues regarding

  (1) Ownership of well-characterized specimens and reagents
  (2) Information sharing

# Approaches to priority setting

- Paradigms of science and technology
- Selection of analytical frameworks
- Process – who sets priorities and how are decisions made ?
- Financing of health R&D
- Mechanisms by which global health priorities get on the global agenda

# Analysis of Health Research Priority Setting



# Five steps approach to priority setting

- Size of disease burden
- Reasons why the burden persists
- Adequacy of the current knowledge base
- Cost-effectiveness of potential interventions and probability of successful development
- Adequacy of the current level of ongoing research in to the health problem

# Balancing burden of disease and other considerations

- While an objective assessment of major causes of disease burden, including risk factors, is an important starting point, it should be balanced by other considerations:
  - Cross-cutting issues
  - Successful transfer of knowledge from one place to another
  - Promises of frontier research

# Findings

- Inherent difficulty of prioritizing

  *"It is a profound and necessary truth that the deep things in science are not found because they are useful, they are found because it was possible to find them"*

Timing, tools, scientific judgment, and intuition have a great role to play in discovering things that are ultimately useful.

# Matrix to synthesize R&D priorities included in individual DCPP chapters

- **New basic knowledge**
  - Biomedical research, genomics
  - Basic epidemiology – diseases and risk factors
  - Disease modeling and surveillance
  - Research on health systems and health services

- **New and Improved tools**
  - Drugs
  - Vaccines
  - Diagnostics
  - Devices, Prostheses and equipment

- **New and improved intervention methods**
  - Knowledge transfer and verification of knowledge in different contexts
  - Treatment algorithms and guidelines
  - Intervention packaging
  - Costing and cost-effectiveness
  - Delivery of interventions (at different levels of the health system)
  - New and improved policy instruments

# Priorities

- Already on the global health research agenda
- Not yet on the global health research agenda but should be addressed as they have great potential
- Interesting topics that may not yet be global priorities but still worthwhile pursuing

# Already on the agenda: (1) Grand Challenges in Global Health

- **Improve childhood vaccines** – create single dose vaccines; vaccines that do not require refrigeration; deliver needle-free delivery systems for vaccination
- **Create new vaccines** – develop reliable tests in model systems to evaluate live attenuated vaccines; solve how to design antigens for effective protective immunity; learn which immunological responses provide protective immunity
- **Control insects that transmit agents of disease** – develop a genetic and chemical strategies to deplete or incapacitate a disease-transmitting insect population
- **Improve nutrition to promote health** – create a full range of optimal bio-available nutrients in a single staple plant
- **Improve drug treatment of infectious diseases** – discover drugs and delivery systems that minimize the likelihood of drug resistant microorganisms
- **Cure latent and chronic infections** – create therapies that can cure latent infections; create immunological methods that can cure chronic infections
- **Measure disease and health status accurately in economically poor countries** – develop technologies that permit quantitative assessments of population health status; develop technologies that allow the assessment of individuals for multiple pathogens at point of care

# Priorities already on the global health research agenda (2)

Unfinished agenda of infectious diseases

- I. New basic knowledge
  - Basic epidemiology
    Multi-center studies on malaria pathogenesis, immunology and clinical outcomes)
  - Disease modeling
    Transmission dynamics (malaria)
    Potential reduction of Tb incidence and mortality by reducing environmental risk factors

- **II. New and improved tools (drugs, vaccines, diagnostics, vector control)**
  - HIV/AIDS, malaria, tuberculosis
  - Helminths, including schistosomiasis

- **III. New and improved intervention methods/intervention packaging**
  - IPT for young children
  - Better diagnosis and treatment of TB through syndromic management of ARI at PHC
  - Comparative costs and cost-effectiveness of interventions
  - Delivery of health services, particularly with a view on scaling up interventions

# Priorities not yet on the global research agenda (1)

Cluster of chronic diseases and major risk factors

- I. New basic knowledge
  - Basic epidemiology
    - Role of alcohol in various kinds of morbidity, particularly social harm (poverty, social exclusion)
    - Extend epidemiological databases on drinking patterns in developing societies
    - Prevalence of drug use
  - Disease modeling and surveillance
    - Develop surveillance systems for chronic diseases and major risk factors, such as obesity, in developing countries
    - Prospecitve studies of mortality and morbidity among illicit opioid users
- II. New and improved tools
    - Randomized clinical trails of folic acid and alpha-linoleic acid for the prevention of CVD in developing countries
- III. New and improved intervention methods
  - Knowledge transfer and verification of knowledge in different contexts
    - Studies of the implementation process of effective control strategies in different contexts (alcohol, tobacco, CVD, neuro-psychiatric diseases)
    - Multi-faceted, community-based demonstration programs to document the feasibility of lifestyle changes in developing countries and to learn more about effective strategies
  - Intervention packaging
    - “polypill” to prevent CVD (as well as complications of diabetes
  - Cost and cost-effectiveness analysis
    - Cost and cost-effectiveness analysis of various prevention strategies

# Priorities not yet on the global research agenda (2)

- Injuries, casualties of war and humanitarian emergencies
- Health systems and health services